Economics Information

Ontario

ESTIMATED COST OF GROWING POTATOES, 1982

AND

PROJECTIONS FOR 1983

By

Blair Campbell

ECONOMICS BRANCH

ONTARIO MINISTRY OF AGRICULTURE AND FOOD
LEGISLATIVE BUILDINGS, TORONTO, ONTARIO, M7A 1B6

ECONOMICS INFORMATION

ESTIMATED COST OF GROWING POTATOES, 1982

AND

PROJECTIONS FOR 1983

by
Blair Campbell

Economics Branch
Ontario Ministry of Agriculture and Food
Legislative Buildings, Queen's Park
Toronto, Ontario M7A 1B6
January 1983

ISBN-0-7743-8151-5

METHODS USED IN UPDATING COSTS

The first step in updating costs to 1982 was to establish a profile of typical producers with regard to production technology, types and quantities of inputs used. Surveys of producers were used almost exclusively to develop this profile. In determining typical field operations, practices recommended by potato specialists were taken into consideration.

Data on the type and frequency of operations performed were based on modal values that were used to represent the most frequently occurring operation practices among the sample farmers. Similarly, modal values were used to define the most typical machinery combinations and most frequently used sprays, fertilizers, and other materials.

Sample averages were used to define labour hours, fertilizer application rates, and other major cost items. Smaller items such as utilities, accounting fees, and general insurance were updated by indexing average costs from the study year to 1982.

MACHINERY

All machinery data was taken from the 1981 survey and represents a line of equipment that producers would own in terms of kind, new cost, age, size, and hours of use. Costs for 1982 were established by assigning a new purchase price to each machine, while keeping the age, size and hours of use constant. Annual costs are estimated in the following manner.

1. Depreciation was calculated by the declining balance method at the rate of 15 percent for powered machinery and 10 percent for others.

2. Growers were assumed to have a 70 percent equity in all equipment. Interest on equity was calculated at the rate of 11.67 percent of 70 percent of the remaining value. Interest on debt was calculated at the rate of 17.43 percent of 30 percent of the remaining value.

3. Housing and insurance were calculated at 1.5 percent of the remaining value.

4. Repairs were estimated from engineering formula and are based on age, new cost, and hours of use.

5. Fuel costs were determined on the basis of 34.2 cents per litre for diesel and 33.2 cents per litre for gasoline. An additional 15 percent was added to the hourly rate to account for oil and grease.

6. Hourly rates based on the above factors were estimated for each machine and then used to establish machinery costs for each field operation.

LABOUR

Labour requirements are based on the 1981 study and represent the amount of time required to perform typical field operations. For 1981 a value of 6.25 was assigned to operator labour and an average of $5.99 per hour for hired labour.

MATERIALS

Quantities of seed, fertilizer, and sprays are based on the 1981 survey. They are representative of actual quantities used and prices paid. Prices for 1982 have been collected by means of farm surveys and from discussions with farm supply companies.

LAND

Land values are based on producer estimates of market value. Land costs were calculated at 3.5 percent of market value[1]. Taxes are those actually paid by producers in 1975, and indexed to 1982 by means of the Eastern Canada Farm Input Price Index.

OTHER COSTS

Miscellaneous costs such as telephone, electricity, accounting fees, subscriptions, and general insurance have been estimated by taking 1.7 percent of total production costs.

MANAGEMENT FEE

An allowance for management was calculated at the rate of 5 percent of the gross returns. Gross returns are defined as the amount of receipts that producers could reasonably expect during the course of a normal year.

INTEREST ON OPERATING CAPITAL

Interest on operating capital was charged at the rate of 1.45 percent per month for a period of nine months.

---

[1] For a detailed account of the methods used in calculating land costs see: Gordon E. Framst, A Method for Determining Enterprise Land Costs, Economic Research (Toronto: Economics Branch, Ontario Ministry of Agriculture and Food, 1981).

POTATO PRODUCTION

The estimated potato production costs for 1982 are presented in Tables 1 through 5. Total costs including harvesting were estimated at $979.63 per acre, or $9.51 per hundredweight (based on an average yield of 217 hundredweight per acre). Any marketing costs such as grading, packing, etc., are not included in the estimate.

Table 2 breaks down the 1982 machinery cost and labour hours by operation. Labour costs were charged at $6.25 per hour for operator, and an average of $5.99 per hour for hired labour.

Table 4 presents a breakdown of other cost items, including overhead items and imputed costs for management and interest on operating capital.

PROJECTED COSTS

Projections as to the cost of growing potatoes in 1983 have been made. The following projected costs are based on the following assumptions:

The projected rate for interest on equity is 8.5 percent and the projected rate for interest on debt is 14.5 percent.

Fuel costs:	Up by 10 percent
Machinery repairs:	Up by 8 percent
Labour:	Hired labour up by 6 percent
Materials:	Fertilizer down by 2 percent
Chemicals:	Up by 4 percent
Land Values:	Down by 10 percent
Interest on Operating Capital:	Down from 17.43 to 14.5 percent

All projected changes in the level of input prices were made after consultation with Economics Branch staff and through meetings and discussions with staff from Statistics Canada.

Table 1.--Estimated Potato Production Costs, Ontario, 1982[a]

	Per Acre	Per Cwt[b]
	- dollars -	
Cash Costs		
Tractor Operating	57.98	0.27
Implement Operating	45.44	0.21
Materials and Other	416.31	1.92
Hired Labour	81.07	0.37
Cash Overhead	95.58	0.44
Total	696.38	3.21
Non-Cash Costs		
Depreciation	51.83	0.24
Interest on Investments	127.21	0.59
Operator Labour	36.94	0.17
Management Allowance	67.27	0.31
Total	283.24	1.31
Total Production Costs	979.63	4.51

[a] Includes all costs including harvesting and loading into storage. Marketing costs such as grading and packing are not included. An allowance for risk is not included in this cost estimate. Crop insurance for 1982 averaged $35 per acre for those who insured.

[b] Based on an average harvested yield of 217 hundredweight per acre.

Table 2.--Estimated Machinery and Labour Costs for Potato Production, Ontario, 1982

Operation	Times Over	Tractors		Machinery		Labour
		Fixed	Variable	Fixed	Variable	
	no.	dollars per acre				hours/ acre
COVER CROP						
Fall plowing	1	2.79	5.09	1.13	0.63	0.33
Discing	2	2.53	4.63	0.84	0.61	0.30
Planting Rye	1	7.41	2.33	1.78	0.27	0.20
Total		6.73	12.05	3.75	1.51	0.83
PREHARVEST						
Spring plowing	1	3.38	6.17	1.37	0.76	0.40
Discing	1	1.27	2.31	0.43	0.30	0.15
Field cultivating	1	1.27	2.31	0.58	0.20	0.15
Cutting seed	1			2.00	0.23	0.35
Haul fertilizer/water	1			0.58	1.54	1.00
Haul seed	1			0.70	1.49	1.00
Planting	1	3.53	8.06	7.75	4.74	1.75
Row cultivating	1	0.88	2.51	5.30	0.97	0.55
Hilling	1	0.53	1.51	0.28	0.13	0.33
Spraying:						
Herbicide	1	0.26	0.73	1.01	0.51	0.16
Insecticide & fung.	6	2.33	5.32	2.36	2.73	0.66
Topkill, fung.	1	0.39	0.89	0.39	0.45	0.11
Total		13.84	29.81	22.75	14.05	6.61
HARVESTING						
Windrowing	1	3.52	8.06	4.07	3.76	1.00
Digging	1	3.52	8.06	10.43	9.11	3.00
Haul to storage	1			13.64	14.19	4.00
Load into storage				6.14	2.82	4.00
Total		7.04	16.12	34.28	29.88	12.00
TOTAL MACHINERY COST & LABOUR HOURS		27.61	57.98	60.78	45.44	19.44
LABOUR COSTS				$/acre		
Operator, 6.09 hours @ $6.25						36.94
Hired[a], 13.35 hours @ $5.99						81.07
Total						118.01

[a] Includes benefits.

Table 3.--Estimated Material Costs and Rates for Potato Production[a], Ontario, 1982

Item	Rate	Unit	Price, $	$/acre
SEED & SEED TREATMENT				
Potato seed	25	75-lb bag	6.50/bag	162.50
Seed treatment	1	lb/cwt seed	0.71/lb	13.31
Rye seed	2	bushel	4.50/bu	9.00
Total				184.81
FERTILIZER				
15-15-15	900	lb	2.40/mt	97.20
SPRAYS	2.8	lb	7.67/lb	21.48
Insecticide:				
1 application	20	lb	1.80/lb	36.00
1 application	1	pint	5.87/pt	5.87
Fungicide:				
2 applications	2	kg	7.03	28.12
4 applications	5/6	pint	5.68/pt	18.93
Vinekiller	1	litre	10.90/L	10.90
Total				121.30
TOTAL MATERIALS				403.31

[a] Considerable variation in the use of fertilizers, herbicides, insecticides, and fungicides can occur depending on whether the crop is early or late season, weather conditions, and variety grown.

Table 4.--Other Estimated Potato Production Costs, Ontario, 1982

Item	$/acre
Land:	
Interest, $2,590/acre @ 3.5%	90.65
Taxes, $4.70/acre	4.70
Total	95.35
Other costs:	
Cash overhead (1.7 percent of Tables 2 and 3)	12.34
Marketing Board fees @ 6¢ per cwt.	13.00
Total	25.34
Management fee	67.27
Interest on operating capital	78.54
TOTAL	266.50

Table 5.--Equipment Used on Potato Study, Ontario, 1982

Machinery	Size	Purchase Price	Age	Use	Variable Costs
		dollars	year	hour	$/hour
Tractor	130 HP	25,440	5	475	23.86
Tractor	95 HP	20,170	5	450	18.73
Tractor	70 HP	11,140	8	330	11.59
Tractor	60 HP	3,160	6	270	6.17
Plow	5 fur	3,985	7	110	5.32
Disc	17 ft.	4,245	10	160	4.83
Grain drill		2,705	5	50	10.26
Field cultivator ...	21 ft.	2,790	6	110	5.15
Seed cutter		2,085	5	60	6.39
Potato planter	2 row	9,885	8	160	12.49
Row cultivator	4 row	3,525	2	80	11.40
Hiller cultivator ..	2 row	825	12	85	1.25
Weed sprayer	10 row	3,850	4	110	9.52
Potato sprayer	60 ft.	4,980	9	160	7.71
Potato windrower ...	2 row	6,245	7	210	7.82
Potato harvester ...	2 row	25,190	7	200	19.54
Bin piler		8,790	8	180	8.96
Truck		3,110	15	200	5.11
Truck		4,145	14	200	5.17
Truck		8,810	11	200	7.78
Truck		4,145	11	200	5.76
Bulk boxes[a] (4)	18 ft.	1,875	5	200	7.72

[a] There are four bulk boxes 18 feet in length with an original purchase price of $1,875.

Table 6.--Projected Potato Production Costs, Ontario, 1983[a]

	Per Acre	Per Cwt[b]
	- dollars -	
Cash Costs		
Tractor Operating	63.95	0.30
Implement Operating	45.92	0.24
Materials and Other	417.62	1.99
Hired Labour	85.44	0.41
Cash Overhead	84.39	0.40
Total	700.91	3.34
Non-Cash Costs		
Depreciation	56.90	0.27
Interest on Investments	112.55	0.54
Operator Labour	38.92	0.19
Management Allowance	65.10	0.31
Total	273.47	1.30
Total Production Costs	974.38	4.64

[a] Includes all costs including harvesting and loading into storage. Marketing costs such as grading and packing are not included. An allowance for risk is not included in this cost estimate.

[b] Based on an average harvested yield of 210 hundredweight per acre.

Table 7.--Estimated Machinery and Labour Costs for Potato Production, Ontario, 1983

Operation	Times Over	Tractors		Machinery		Labour
		Fixed	Variable	Fixed	Variable	
	no. *	dollars per acre				hours/ acre
COVER CROP						
Fall plowing	1	2.83	5.60	1.01	0.69	0.33
Discing	2	2.57	5.08	0.81	0.66	0.30
Planting Rye	1	1.43	2.48	1.74	0.30	0.20
Total		6.83	13.17	3.56	1.65	0.83
PREHARVEST						
Spring plowing	1	3.43	6.79	1.22	0.83	0.40
Discing	1	1.29	2.55	0.40	0.33	0.15
Field cultivating ...	1	2.29	2.55	0.50	0.20	0.15
Cutting seed	1			1.95	0.23	0.35
Haul fertilizer/water	1			0.57	1.68	1.00
Haul seed	1			0.68	1.63	1.00
Planting	1	3.79	8.93	7.79	5.34	1.75
Row cultivating	1	0.86	2.76	5.14	1.06	0.55
Hilling	1	0.51	1.66	0.30	0.14	0.33
Spraying:						
Herbicide	1	0.25	0.80	1.05	0.60	0.16
Insecticide & fung.	6	2.50	5.89	2.32	3.00	0.66
Topkill, fung.	1	0.43	0.99	0.39	0.50	0.11
Total		14.35	32.92	22.31	15.57	6.61
HARVESTING						
Windrowing	1	3.79	8.93	3.90	4.01	1.00
Digging	1	3.79	8.93	9.91	9.75	3.00
Haul to storage	1			13.21	15.34	4.00
Load into storage ...				6.23	3.20	4.00
Total		7.58	17.86	33.25	32.30	12.00
TOTAL MACHINERY COST & LABOUR HOURS		28.74	63.95	59.12	49.52	19.44
LABOUR COSTS						
						$/acre
Operator, 6.09 hours @ $6.50						38.92
Hired, 13.35 hours @ $6.35						85.44
Total						124.36

[a] Included in the haul to storage operation.

Table 8.--Projected Material Costs and Rates for Potato Production[a], Ontario, 1983

Item	Rate	Unit	Price, $	$/acre
SEED & SEED TREATMENT				
Potato seed	25	75-lb bag	6.50/bag	162.50
Seed treatment	1	lb/cwt seed	0.74/lb	13.87
Rye seed	2	bushel	4.50/bu	9.00
Total				183.37
FERTILIZER				
15-15-15	900	lb	216/mt	93.60
SPRAYS	2.8	lb	7.97/lb	22.32
Insecticide:				
1 application	20	lb	1.87/lb	37.40
1 application	1	pint	6.10/pt	6.10
Fungicide:				
2 applications	2	kg	7.31	29.24
4 applications	5/6	pint	5.90/pt	19.66
Vinekiller	1	litre	11.33/L	11.33
Total				126.05
TOTAL MATERIALS				405.02

[a] Considerable variation in the use of fertilizers, herbicides, insecticides, and fungicides can occur depending on whether the crop is early or late season, weather conditions, and variety grown.

Table 9.--Projected Estimated Potato Production Costs, Ontario, 1983

Item	$/acre
Land:	
Interest, $2,331/acre @ 3.5%	81.58
Taxes, $4.70/acre	4.70
Total	86.28
Other costs:	
Cash overhead (1.7 percent of Tables 7 and 8)	12.64
Marketing Board fees @ 6¢ per cwt.	12.60
Total	25.24
Management fee	67.05
Interest on operating capital	78.54
TOTAL	243.67

OPERATIONS PERFORMED ON THE POTATO CROP

COVER CROP

1. Fall plowing.
2. Discing, twice over.
3. Planting rye.

PREHARVEST OPERATIONS

1. Spring plowing.
2. Discing, once over.
3. Field cultivating, once over.
4. Cutting seed.
5. Hauling seed, fertilizer, and water to the field.
6. Planting.
7. Row cultivating, once over.
8. Hilling, once over.
9. Spraying weeds, once over.
10. Spraying for insect, late and early blight, six times. In some instances, an insecticide and fungicide were mixed.
11. Spraying for topkill, once over.

HARVEST OPERATIONS

1. Windrowing.
2. Digging.
3. Grading on harvester.
4. Hauling to, and loading into storage.
5. Grading into storage.

MATERIALS--costs and rates of application are given in Table 3. The following quantities were used on a per acre basis.

1. Seed, 25 75-pound bags.
2. Fertilizer, 900 pounds of 15-15-15.
3. Rye seed, 2 bushels.
4. Herbicide, one application of Lorox at 2.8 pounds per acre.
5. Insecticide, one application of Temik at 20 pounds per acre; and one application of Meta-Systox R at 1 pint per acre.
6. Fungicide, two applications of Dithane M45 at 2 kilograms per acre; and four applications of Bravo at an average rate of 5/6 pints per acre.
7. Vinekiller, one application of Reglone at the rate of one litre per acre.